REMARKS:

The Examiner rejected claims 1-8, 10, 11 and 16-33 under 35 U.S.C. §103(a) as being unpatentable over *Takahashi et al.* (U.S. Patent Application Publication No. 2004/0218573, hereinafter "*Takahashi*") in view of Venkitaraman et al. (U.S. Patent Application Publication No. 2003/0161287, hereinafter "*Venkitaraman*"). *See pp. 2-8 of the Office Action.* These rejections are respectfully disagreed with and are traversed below.

To warrant a §103(a) rejection of one or more claims, in view of all factual information, it must be determined that the claimed invention "as a whole" would have been obvious to one of ordinary skill in the art at the time the invention was made. The conclusion must be reached on the basis of the facts gleaned from the prior art. *See MPEP §2142.*

"All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). *See, MPEP §§2142, 2143.03.*

"The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness." *See, MPEP §2142.*

I. *VENKITARAMAN*

In paragraphs [0033]-[0042] and FIGS. 3-7, *Venkitaraman* discloses a sequence of messages and binding information as exchanged among a number of devices in a communication system. *See [0033].* This sequence is summarized below with references to applicable portions of

Venkitaraman. The sequence begins with the premise of a correspondent node (CN) desiring to communicate with a mobile network node (MNN). Initially, the CN does not know that the MNN is attached to a Mobile Router (MR).

(1) CN sends a first message to the home address of the MNN (HA_{MNN}), which is routed to the Home Agent (HA). *See [0034], FIG. 3.*

(2) The HA checks its binding cache and finds a care-of address (CoA) for the MNN (CoA_{MNN}), where the CoA_{MNN} indicates the MNN is reachable via a CoA for the MR (CoA_{MR}), i.e., via the subnet (mobile network, MN) within which the MNN is located. (Note that this assumes that the HA has been informed of the CoA_{MNN}.) *See [0035], FIG. 4.*

(3) The HA encapsulates the first message and addresses a second message to the MR (via the CoA_{MR}). *See [0035], FIG. 4.*

(4) The MR receives the second message and encapsulates it in a third message, with the third message sent/routed to the MNN. *See [0036], FIG. 5.*

(5) The MR sends a first binding update (BU_1) to the CN, where the BU_1 informs the CN of the CoA_{MR} (i.e., mapping the CoA_{MR} to the current network address of the MR), enabling the CN to send future messages/packets directly to the MR (instead of to a home address of the MR, HA_{MR}). Note that the CN has not yet been informed regarding the MNN (i.e., that the MNN is reachable via the MR). *See [0038].*

(6) The MNN sends a second binding update (BU_2) to the CN, where BU_2 maps the HA_{MNN} to the CoA_{MNN} (which is the CoA_{MR} in this case). This enables the CN to send future messages directly to the MNN (i.e., without having them first routed to the HA via the HA_{MNN}) via the MR (i.e., the CoA_{MR}) to which the MNN is attached. *See [0039], FIG. 6.*

(7) For future messages, the CN performs a nested lookup of its binding cache. For example, for a message directed to the MNN the CN will check its binding cache for a CoA_{MNN}, which in this case identifies the MR. The CN will then recheck its binding cache for a CoA_{MR} and address the message to the MR accordingly. *See [0040]-[0042], FIG. 7.*

On page 3 of the Office Action, the Examiner admitted:

> Takahashi however is silent on disclosing explicitly, sending a second neighbor advertisement from the MR to the AN on behalf of the MNN, the second neighbor advertisement comprising a mapping between the CoA of the MNN and a LLA of the MR (LLA_MR); and based on the second neighbor advertisement, constructing a second neighbor that associates the CoA with the LLA_MR.

On page 4 of the Office Action, the Examiner applied *Venkitaraman*, arguing:

> Venkitaraman, however, discloses the Monet environment in which, sending a second neighbor advertisement from the MR to the AN on behalf of the MNN, the second neighbor advertisement comprising a mapping between the CoA of the MNN and a LLA of the MR (LLA_MR) (Vekitaraman, Fig. 1, [0023], where mapping between the CoA and LLA_MR is given and site1 and site2 are equivalent to first and second neighbor); and
>
> based on the second neighbor advertisement, constructing a second neighbor that associates the CoA with the LLA_MR (Venkitaraman, [0023], where functionality of mapping address as explained above is disclosed, Venkitaraman, [0026] further discloses that doing so second mobile network, in turn may attach to the third mobile network and so forth, meaning this set up can be repeated network after network).

The Examiner's interpretation and application of *Venkitaraman* is respectfully disagreed with.

(A) *Venkitaraman* does not disclose or suggest any operations in relation to a link layer address of a mobile network node. While *Venkitaraman* mentions the use of IP addresses, an IP address is not the same as a link layer address. Furthermore, a text search of *Venkitaraman*

reveals no instances of the terms "link layer" or "link layer address." As such, *Venkitaraman* does not disclose or suggest "sending a second neighbor advertisement from the MR to the AN on behalf of the MNN, **the second neighbor advertisement comprising a mapping between the CoA of the MNN and a LLA of the MR (LLA_MR)**," as recited in claim 1.

(B) The binding updates disclosed by *Venkitaraman* are sent from the MR 112 or the MNN 116 to the CN 126. *Venkitaraman* does not disclose any binding updates that are sent to an access network. Therefore, *Venkitaraman* does not disclose or suggest "**sending a second neighbor advertisement from the MR to the AN** on behalf of the MNN, the second neighbor advertisement comprising a mapping between the CoA of the MNN and a LLA of the MR (LLA_MR)," as recited in claim 1.

(C) According to *Venkitaraman*, the second binding update sent by the MNN 116, which presumably passes through the MR 112, is merely transmitted by the MR 112. That is, there is no indication that the MR 112 alters the second binding update or performs any action other than merely furthering transmission of the second binding update to the CN 126. In contrast, as recited in claim 1 the second neighbor advertisement (sent "from the MR to the AN on behalf of the MNN") is different from the first neighbor advertisement (sent from the MNN to the MR). As recited in claim 1, the MR sends a different neighbor advertisement (the second neighbor advertisement) than it receives from the MNN (the first neighbor advertisement). *Venkitaraman* discloses no such functionality.

(D) From the above description of *Venkitaraman*, it is clear that the binding cache resides in the CN 126, which is a node that communicates with the MNN 116 via various intermediate components, including a MR 112 and a site router 118 of site1. *See FIG. 1*. Furthermore, the CN 126 does not correspond to an "access router" and, thus, there is no disclosure by *Venkitaraman* concerning a binding cache in an access router (e.g., site router 118). *Venkitaraman* does not disclose or suggest "based on the second neighbor advertisement, **constructing a second neighbor cache in the AR** that associates the CoA with the LLA_MR," as recited in claim 1.

(E) From the above description of *Venkitaraman*, it is also clear that *Venkitaraman* does not disclose or suggest "based on the first neighbor advertisement, constructing a first neighbor cache in the MR that associates the CoA with the LLA," as recited in claim 1. While the Examiner does not argue otherwise, this element of claim 1 is related to the second neighbor advertisement which the Examiner argued is disclosed by *Venkitaraman*. As such, it is noted that the system and method of *Venkitaraman* further differs from that recited in claim 1 and, thus, that *Venkitaraman* cannot be seen to disclose or suggest at least those elements recited in claim 1 for which the Examiner argued.

It is noted that *Takahashi*, which the Examiner combined with *Venkitaraman* in the §103(a) rejection of claim 1, does not remedy the above-noted defects of *Venkitaraman*, nor did the Examiner argue otherwise.

II. *TAKAHASHI*

In the Office Action, the Examiner did not respond to the previous arguments presented concerning *Takahashi*. As such, these arguments are repeated below.

The disclosure of *Takahashi* is directed to "reducing the CoA update duration necessary between establishment of a connection of the mobile node with a data link layer and completion of the CoA update when the mobile node switches a link connected to the IP network, to another." *See para. [0008]*. In furtherance of this direction, *Takahashi* discloses a mobile node comprising "list acquiring means for acquiring a list of access nodes existing on neighboring links to the link used for connection by the mobile node." The mobile node also includes "CoA list creating means for creating a list of CoAs corresponding to the respective access nodes entered in the acquired access node list, each CoA being used as a destination address of the mobile node at a link on which an access node corresponding thereto exists." The mobile node further includes "access node address acquiring means for, where the mobile node changes the connected link to

another link, acquiring a data link layer address of an access node existing on the link after the change." The mobile node also includes "default router detecting means for detecting a default router on the basis of the acquired data link layer address with reference to the access node list; primary CoA detecting means for detecting a CoA with a network prefix corresponding with a subnet prefix of the default router, as a primary CoA from the list of CoAs" and "path update requesting means for requesting the mobility control apparatus to update a path of a packet addressed to the mobile node, by the primary CoA." *See para. [0009].*

As a further explanation concerning the disclosure of *Takahashi*, consider the following. The mobile node acquires a list of access node for neighboring links to the currently-used link. The mobile node then creates a CoA list for the neighboring nodes, where the CoAs correspond to destination addresses of the mobile node for each of the neighboring links. Note that this CoA list, and the CoAs generated therefor, appears to be anticipatory. That is, the mobile node creates the CoA for itself for neighboring links *prior to switching to any of the neighboring links*. Subsequently, the mobile nodes changes to a different link, acquires a data link layer address of an access node on the link, detects a default router based on the acquired data link layer address (using the access node list), and detects a primary CoA using this information and the CoA list. The path for the mobile node is then updated. In such a manner, the mobile node uses a CoA from the CoA list that was created prior to switching links. *See para. [0011].*

Paragraph [0061] of *Takahashi* describes the above-noted operations in relation to a mobile node (MN) 10 shown in FIG. 2. It should be noted that the overall system arrangement is shown in FIG. 1, including the MN 10, an "access router (AR) 30 as an access node for providing a link for connection of [the] MN 10 to a packet communication network," and a "mobility anchor point (MAP) 50 managing movement of mobile node 10." *See para. [0060].*

First, it should be noted that *Takahashi* does not disclose or suggest use of a mobile router, such as that recited in claim 1 of the instant application, for example. The described MAP 50 is more akin to a home agent of the MN 10 than to a mobile router. For example, *Takahashi* repeatedly describes how the MNN 10 advertises the network layer address and data link layer address of the

AR 30 to the MAP 50. *See, e.g., paras. [0064], [0068], [0069], [0077].* As a further example, *Takahashi* discloses that the MN 10 sends a binding update (BU) 64 to the MAP 50. BUs are typically sent from a mobile node to the home agent in order to inform the home agent concerning mobility of the mobile node. The operations disclosed by *Takahashi* with respect to the BU 64 comport with the conventional usage of BUs. *See e.g., paras. [0068], [0077].* It appears that *Takahashi* only discusses movement of the MN 10 amongst different ARs, particularly with respect to sending a BU 64 to the MAP 50 (e.g., the home agent) and obtaining an access node list from the MAP 50.

Furthermore, *Takahashi* does not disclose or suggest the presence of a mobile network having one or more intermediate nodes (e.g., a mobile router) between the MN 10 and the AR 30. *See, e.g., FIG. 1, 14.* For example, in FIG. 14 *Takahashi* depicts the MN 10 connecting to the AR 30 via an access point (AP) 20. However, the AP 20 is illustrated as a stationary object whereas at least in some exemplary embodiments a mobile router (e.g., MR 3 in the instant application) may switch between different APs (e.g., see FIG. 2 of the instant application). Furthermore, *Takahashi* does not disclose or suggest that the AP 20 be part of a mobile network.

Clearly, *Takahashi* does not disclose or suggest usage of a mobile router. Furthermore, *Takahashi* also cannot be seen to disclose or suggest use of a mobile network, such as one wherein at least one mobile node is behind a mobile router with both being part of a mobile network. Since *Takahashi* does not disclose or suggest the use of a mobile router and/or a mobile network, *Takahashi* cannot be seen to relate to the subject matter recited in claim 1 since claim 1 recites operations relating to a mobile network (MONET) that has a mobile router (MR) and a mobile network node (MNN).

More specifically, *Takahashi* does not disclose or suggest: "A method to manage addresses in a network, comprising: **when connecting a mobile router (MR) of a mobile network (MONET)** to an access point (AP) of an access network (AN) that includes an Access Router (AR), sending a first neighbor advertisement **from a mobile network node (MNN)**, the first neighbor advertisement comprising a care of address (CoA) and a link layer address (LLA) of **the MNN**

within the MONET; based on the first neighbor advertisement, constructing a first neighbor cache **in the MR** that associates the CoA with the LLA; sending a second neighbor advertisement **from the MR to the AN on behalf of the MNN**, the second neighbor advertisement comprising a mapping between the CoA of the MNN and a LLA of the MR (LLA_MR); and based on the second neighbor advertisement, constructing a second neighbor cache in the AR that associates the CoA with the LLA_MR," as recited in claim 1.

Claim 1 recites: "the first neighbor advertisement comprising a care of address (CoA) and a link layer address (LLA) of the MNN within the MONET; based on the first neighbor advertisement, **constructing a first neighbor cache in the MR that associates the CoA with the LLA**."

In FIGS. 7 and 15, *Takahashi* shows formats for the access node list that is described. In FIG. 7, the access node list includes sequence numbers, network layer addresses of ARs and valid durations, and data link layer addresses of ARs and valid durations. In FIG. 15, the access node list also includes data link layer address of APs and valid duration. At no point does *Takahashi* disclose that the access node list includes any information for the mobile node. In contrast, the first neighbor cache constructed in the MR associates the CoA of the MNN with the LLA of the MNN. Clearly, the access node list of *Takahashi* cannot be seen to correspond to, disclose or suggest the first neighbor cache in the MR, as recited in claim 1.

In FIG. 10, *Takahashi* illustrates the format for the CoA list. "[T]he CoA list contains information of the sequence number, CoA, and valid duration of each CoA, and a primary CoA described later is given information indicating 'primary CoA.'" *See para. [0074]*. First, it is noted that the described CoA list is created by the mobile node and, thus, kept in the mobile node. *Takahashi* does not disclose or suggest that the CoA list be sent or transmitted to any other component or device. *Takahashi* only discloses transmission of the access node list from the MAP to the MN. Furthermore, this comports with use of the CoA list as described by *Takahashi* since the CoA list is particular to the mobile node in question as it includes CoAs for that mobile node via neighboring links. Clearly, the CoA list of *Takahashi* cannot be seen to correspond to or suggest the first neighbor cache in the MR, as recited in claim 1.

Based on the above, it is apparent that *Takahashi* does not disclose or suggest "the first neighbor advertisement comprising a care of address (CoA) and a link layer address (LLA) of the MNN within the MONET; based on the first neighbor advertisement, constructing a first neighbor cache in the MR that associates the CoA with the LLA," as recited in claim 1.

It is also noted that, as explained above, neither the access node list nor the CoA list of *Takahashi* can be seen to correspond to the second neighbor advertisement or second neighbor cache, as recited in claim 1. Furthermore, since *Takahashi* does not disclose or suggest use of a mobile router that sends an advertisement on behalf of a mobile node, *Takahashi* cannot be seen to disclose or suggest the second neighbor advertisement, as recited in claim 1, which is sent from the MR to the AN on behalf of the MNN.

Thus, *Takahashi* does not disclose or suggest "sending a second neighbor advertisement from the MR to the AN on behalf of the MNN, the second neighbor advertisement comprising a mapping between the CoA of the MNN and a LLA of the MR (LLA_MR)," as recited in claim 1. Since *Takahashi* does not disclose the above-noted elements of claim 1, *Takahashi* further does not disclose or suggest "based on the second neighbor advertisement, constructing a second neighbor cache in the AR that associates the CoA with the LLA_MR," as recited in claim 1.

It is noted that *Venkitaraman*, which the Examiner combined with *Takahashi* in the §103(a) rejection of claim 1, does not remedy the above-noted defects of *Takahashi*, nor did the Examiner argue otherwise.

III. CLAIMS 2, 7-9 AND 16-33

Since *Takahashi* and *Venkitaraman*, considered separately or in combination, do not disclose or suggest the elements recited in claim 1 of the instant application, *Takahashi* in view of *Venkitaraman* certainly does not render claim 1 obvious. Therefore, claim 1 is patentable and

should be allowed.

Though dependent claim 2 contains its own allowable subject matter, claim 2 should at least be allowable due to its dependence from allowable claim 1. In order to expedite prosecution, it is briefly noted that *Takahashi* and *Venkitaraman*, considered separately or in combination, do not further disclose or suggest the elements recited in claim 2.

It is briefly noted that the binding cache disclosed by *Venkitaraman* is not similar to the neighbor cache of claim 2. The mobile IPv6 binding cache of a home agent or correspondent node maps home addresses of mobile nodes to the current care-of addresses. In contrast, the neighbor cache recited in claim 2 is a different type of entry that associates one or more link layer addresses.

Independent claim 7 claims similar features as claim 1 noted above. For the same reasons stated above with respect to claim 1, independent claim 7 is not rendered obvious by *Takahashi* in view of *Venkitaraman*. Therefore, independent claim 7 is patentable and should be allowed.

Though dependent claim 8 contain its own allowable subject matter, claim 8 should at least be allowable due to its dependence from allowable claim 7. It is briefly noted that dependent claim 8 recites subject matter similar to dependent claim 2 as noted above. Thus, the additional arguments presented for claim 2 are further applied to dependent claim 8.

Independent claims 16, 21, 25, 29, 32 and 33 claim features similar to those recited in claim 1. It is noted that the scope of these claims is not identical to that of claim 1, rather that the elements recited in claims 16, 21, 25, 29, 32 and 33 generally may be found in claim 1. For the same reasons stated above with respect to claim 1, independent claims 16, 21, 25, 29, 32 and 33 are not rendered obvious by *Takahashi* in view of *Venkitaraman*. Therefore, independent claims 16, 21, 25, 29, 32 and 33 are patentable and should be allowed.

Though dependent claims 17-20, 22-24, 26-28, 30 and 31 contain their own allowable subject matter, these claims should at least be allowable due to their dependence from allowable claims

16, 21, 25 and 29.

IV. CLAIMS 3-6, 10 AND 11

Contrary to the Examiner's supposition on pages 3 and 6 of the Office Action, independent claims 3, 5 and 10 expressly **do not** recite the same elements as those recited in independent claims 1 and/or 7.

As a non-limiting example, independent claim 3 recites:

> A method to manage addresses in a network, comprising:
>
> when connecting a mobile router (MR) of a mobile network (MONET) to an access point (AP) of an access network (AN) that includes an Access Router (AR), sending a first neighbor advertisement from a mobile network node (MNN), the first neighbor advertisement comprising a care of address (CoA) and a link layer address (LLA) of the MNN within the MONET;
>
> based on the first neighbor advertisement, constructing a first neighbor cache in the MR that associates the CoA with the LLA, **and constructing a mapping table that associates the CoA with one of a set of LLAs of the MR (LLA_MRi)**;
>
> sending a second neighbor advertisement from the MR to the AN on behalf of the MNN, the second neighbor advertisement comprising **a mapping between the CoA of the MNN and the LLA_MRi**; and

based on the second neighbor advertisement, **constructing a second neighbor cache in the AR that associates the CoA with the LLA_MRi**.

As another non-limiting example, independent claim 5 recites:

A method to manage addresses in a network, comprising:

when connecting a mobile router (MR) of a mobile network (MONET) to an access point (AP) of an access network (AN) that includes an Access Router (AR), sending a first neighbor advertisement from a mobile network node (MNN), the first neighbor advertisement comprising a care of address (CoA) and a link layer address (LLA) of the MNN within the MONET;

based on the first neighbor advertisement, **constructing a mapping table in the MR that associates the LLA of the MNN with one of a set of LLAs of the MR (LLA_MRi)**;

sending a second neighbor advertisement from the MR to the AN on behalf of the MNN, the second neighbor advertisement comprising **a mapping between the CoA of the MNN and the LLA_MRi**; and

based on the second neighbor advertisement, constructing a neighbor cache in the AR **that associates the CoA with the LLA_MRi**.

Independent claim 10 recites subject matter similar to that of independent claim 3. As a non-limiting example, the subject matter recited in claims 3 and 10 generally may be seen to correspond to FIG. 4. As another non-limiting example, the subject matter recited in claim 5 generally may be seen to correspond to FIG. 5.

The Examiner's rejection of independent claims 3, 5 and10 is traversed as being insufficient since

the Examiner failed to identify one or more references that are alleged to disclose or suggest all of the elements recited in independent claims 3, 5 and 10.

Notwithstanding the above, with respect to independent claims 3, 5 and 10, these claims further recite aspects concerning a set of LLAs of the MR (LLA_MRi). FIG. 15 of Takahashi et al. shows an access node list format. Each AR shown in FIG. 15 only has one network layer address and one data link layer address. Thus, FIG. 15 does not show a set of LLAs assigned to a (single) MR. Furthermore, there is no indication that any address shown in FIG. 15 is one of a set of LLAs assigned to a (single) MR. It is also noted that *Venkitaraman* does not remedy this defect of *Takahashi*.

Takahashi and *Venkitaraman*, considered separately or in combination, do not disclose or suggest the use of a set of LLAs for a single mobile router. Thus, independent claims 3, 5, 10 and 13 are patentable over the cited prior art (i.e., the prior art cited for claim 1) and should be allowed.

Though dependent claims 4, 6 and 11 contain their own allowable subject matter, these claims should at least be allowable due to their dependence from allowable independent claims 3, 5 and 10.

V. FURTHER ARGUMENTS

The Applicants respectfully reserve the right to argue other portions of one or more of the independent or dependent claims. The arguments presented above are merely exemplary as it is believed that the arguments presented for the independent claims should be sufficient to address the Examiner's claim rejections. The Applicants expressly do not concede any alleged correspondence, disclosure or suggestion that is argued by the Examiner with respect to one or more of the independent or dependent claims.

VI. CONCLUSION

The Examiner is respectfully requested to reconsider and remove the rejections of claims 1-8, 10, 11 and 16-33 under 35 U.S.C. §103(a) and to allow all of the pending claims as now presented for examination. For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record. Should any unresolved issue remain, the Examiner is invited to call Applicants' agent at the telephone number indicated below.

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